Listing of the Claims:

1. (Currently Amended) A position control system for a fluid operated cylinder having at least one fluid chamber defined by a piston located within a housing for movement between first and second end limits of travel, the system comprising:

at least two electrically actuated proportional flow valves connected to each port of the fluid operated cylinder to be controlled for selectively and proportionally controlling fluid flow into and out of the at least one fluid chamber of the fluid operated cylinder to be controlled;

at least one pressure sensor for measuring fluid pressure with respect to each chamber of the fluid operated cylinder to be controlled;

at least one discrete position sensor including a first position sensor located adjacent a midpoint of the fluid operated cylinder to be controlled for sensing a discrete centered position of the piston within the cylinder; and

a controller having a control program operably connected to the at least two valves, the at least one pressure sensor, and the at least one position sensor for controlling actuation of the at least two valves in response to pressure measured by the at least one pressure sensor and location measured by the at least one position sensor, the controller having the control program for calculating a required pressure in the at least one expandable fluid chamber for moving the piston a desired distance within the housing from the discrete centered position located midway with respect to the housing, and for controlling the at least two electrically actuated proportional flow valves to obtain the calculated pressure within the at least one expandable fluid chamber corresponding to the desired distance of movement for the piston within the housing.

2. (Previously Presented) The system of claim 1, wherein the at least one discrete position sensor further comprises:

a second position sensor located adjacent one end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining the at least one chamber.

3. (Original) The system of claim 1 further comprising:

the at least two electrically actuated proportional flow valves including a first valve associated with the first expandable fluid chamber for selectively and proportionally controlling fluid flow into the first expandable fluid chamber and a second valve associated with the first expandable fluid chamber for selectively and proportionally controlling fluid flow out of the first expandable fluid chamber.

4. (Original) The system of claim 1 further comprising:

the at least one expandable fluid chamber including a first expandable fluid chamber adjacent one end of travel of the piston in the housing and a second expandable fluid chamber adjacent another end of travel of the piston in the housing.

5. (Original) The system of claim 4 further comprising:

the at least one pressure sensor includes a first pressure sensor associated with the first expandable fluid chamber and a second pressure sensor associated with the second expandable fluid chamber.

6. (Previously Presented) The system of claim 4 further comprising:

the at least one discrete position sensor including a second position sensor located adjacent one end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining one chamber, and a third position sensor located adjacent an opposite end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining another chamber.

7. (Previously Presented) The system of claim 1 wherein the control program is operable to initialize a home position when the piston is sensed by the first position sensor located adjacent the midway position with respect to the housing.

8. (Cancelled).

9. (Currently Amended) The system of claim 1 further comprising:

means for biasing the piston toward ~~the discrete centered~~ a predetermined position with respect to the housing.

10. (Currently Amended) A process for operating a position control system for a fluid operated cylinder having at least one fluid chamber defined by a piston located within a housing for movement between first and second end limits of travel, the process comprising the steps of:

selectively and proportionally controlling fluid flow into and out of the at least one fluid chamber of the fluid operated cylinder to be controlled with at least two electrically actuated proportional flow valves connected to each port of the fluid operated cylinder to be controlled;

measuring fluid pressure with respect to each chamber of the fluid operated cylinder to be controlled with at least one pressure sensor;

sensing a position of the piston within the cylinder with at least one discrete position sensor, the at least one discrete position sensor including a first position sensor located adjacent a midpoint of the fluid operated cylinder to be controlled; and

controlling actuation of the at least two valves in response to pressure measured by the at least one pressure sensor and location measured by the at least one position sensor with a controller having a control program operably connected to the at least two valves, the at least one pressure sensor, and the at least one position sensor, wherein the controlling step with a control program further includes the steps of calculating a required pressure in the at least one expandable fluid chamber for

moving the piston a desired distance within the housing from the discrete centered position located midway with respect to the housing, and controlling the at least two electrically actuated proportional flow valves to obtain the calculated pressure within the at least one expandable fluid chamber corresponding to the desired distance of movement for the piston within the housing.

11. (Previously Presented) The process of claim 10, further comprising the steps of:

sensing a discrete position adjacent one end of travel of the piston with respect to the housing with a second position sensor, the second position sensor adjacent one end of travel of the piston in the housing; and

decelerating the piston to a soft stop prior to contact with an end wall of the housing defining the at least one chamber with the controller in response to the second position sensor.

12. (Previously Presented) The process of claim 10, wherein the controlling fluid flow step with at least two electrically actuated proportional flow valves further comprises the steps of:

providing a first valve associated with the first expandable fluid chamber for selectively and proportionally controlling fluid flow into the first expandable fluid chamber; and

providing a second valve associated with the first expandable fluid chamber for selectively and proportionally controlling fluid flow out of the first expandable fluid chamber.

13. (Previously Presented) The process of claim 10 wherein the at least one expandable fluid chamber further comprises the steps of:

providing a first expandable fluid chamber adjacent one end of travel of the piston in the housing; and

providing a second expandable fluid chamber adjacent another end of travel of the piston in the housing.

14. (Previously Presented) The process of claim 13, wherein the pressure sensing step with at least one pressure sensor further comprises the steps of:

providing a first pressure sensor associated with the first expandable fluid chamber; and

providing a second pressure sensor associated with the second expandable fluid chamber.

15. (Previously Presented) The process of claim 13, further comprising the steps of:

providing a second position sensor located adjacent one end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining one chamber; and

providing a third position sensor located adjacent an opposite end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining another chamber.

16. (Previously Presented) The process of claim 10, wherein the controlling step with a control program further comprises the step of:

initializing a home position when the piston is sensed by the at least one discrete position sensor to be located at the discrete centered position with respect to the housing.

17. (Cancelled).

18. (Currently Amended) The process of claim 10 further comprising the step of:

biasing the piston toward ~~the discrete centered~~ a predetermined position with respect to the housing.

19. (Currently Amended) A position control system for a fluid operated cylinder having two fluid chambers defined by a piston located within a housing for movement between first and second end limits of travel, the system comprising:

four electrically actuated proportional flow valves, two valves connected to each port of the fluid operated cylinder to be controlled for selectively and proportionally controlling fluid flow into and out of the two fluid chambers of the fluid operated cylinder to be controlled;

two pressure sensors, one pressure sensor for measuring fluid pressure with respect to each chamber of the fluid operated cylinder to be controlled;

at least one discrete position sensor including a first position sensor located adjacent a midpoint of the fluid operated cylinder to be controlled for sensing a discrete centered position of the piston within the cylinder; and

a controller having a control program operably connected to the four valves, the two pressure sensors, and the at least one position sensor for controlling actuation of the four valves in response to pressure measured by the two pressure sensors and location measured by the at least one position sensor, the controller having the control program for calculating a required pressure in each of the first and second expandable fluid chambers for moving the piston a desired distance within the housing from the discrete centered position located midway with respect to the housing, and for controlling the four electrically actuated proportional flow valves to obtain the calculated pressure within each of the first and second expandable fluid chambers corresponding to the desired distance of movement for the piston within the housing.

20. (Previously Presented) The system of claim 19 further comprising:

the at least one discrete position sensor including a second position sensor located adjacent one end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining the first chamber, and a third position sensor located adjacent an opposite end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining the second chamber.

21. (Previously Presented) The system of claim 19 wherein the control program is operable to initialize a home position when the piston is sensed by the at least one discrete position sensor located adjacent the midway position with respect to the housing.

22. (Cancelled).

23. (Currently Amended) A position control system for a fluid operated cylinder having at least one fluid chamber defined by a piston located within a housing for movement between first and second end limits of travel, the system comprising:

at least two electrically actuated proportional flow valves connected to each port of the fluid operated cylinder to be controlled for selectively and proportionally controlling fluid flow into and out of the at least one fluid chamber of the fluid operated cylinder to be controlled;

at least one discrete position sensor associated with the fluid operated cylinder to be controlled for sensing a discrete position of the piston within the cylinder;

a supply of pressurized fluid in communication with the at least two electrically actuated proportional flow valves at a predetermined pressure; and

a controller having a control program operably connected to the at least two valves and the least one position sensor for controlling respective positions of the at least two valves in response to position measured by the at least one position

sensor, the controller having the control program for calculating a required pressure in the at least one expandable fluid chamber for moving the piston a desired distance within the housing from the discrete centered position located midway with respect to the housing, and for controlling the at least two electrically actuated proportional flow valves to obtain the calculated pressure within the at least one expandable fluid chamber corresponding to the desired distance of movement for the piston within the housing.

24. (Previously Presented) The system of claim 23, wherein the at least one discrete position sensor further comprises:

a first position sensor located adjacent a midpoint of the fluid operated cylinder; and

a second position sensor located adjacent one end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining the at least one chamber.

25. (Previously Presented) The system of claim 23 further comprising:

the at least two electrically actuated proportional flow valves including a first valve associated with the first expandable fluid chamber for selectively and proportionally controlling fluid flow into the first expandable fluid chamber and a second valve associated with the first expandable fluid chamber for selectively and proportionally controlling fluid flow out of the first expandable fluid chamber.

26. (Previously Presented) The system of claim 23 further comprising:

the at least one expandable fluid chamber including a first expandable fluid chamber adjacent one end of travel of the piston in the housing and a second expandable fluid chamber adjacent another end of travel of the piston in the housing.

27. (Previously Presented) The system of claim 26 further comprising:

the at least one discrete position sensor including a first position sensor located adjacent a midpoint of the fluid operated cylinder, a second position sensor located adjacent one end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining one chamber, and a third position sensor located adjacent an opposite end of travel of the piston in the housing for providing soft stop deceleration of the piston prior to contact with an end wall of the housing defining another chamber.

28. (Previously Presented) The system of claim 23 wherein the control program is operable to initialize a home position when the piston is sensed by the at least one discrete position sensor located adjacent the midway position with respect to the housing.

29. (Cancelled).

30. (Currently Amended) The system of claim 23 further comprising:

means for biasing the piston toward ~~the discrete center~~ a predetermined position with respect to the housing.

31. (New) The system of claim 1 further comprising:

the control program having variables to define a motion profile of the piston selected from a group of a plurality of motion profiles consisting of an acceleration profile, a deceleration profile, a velocity profile, a timing profile, a force profile, a repetition profile, and any combination thereof.

32. (New) The process of claim 10 further comprising the steps of:

selecting variables for the control program to define a motion profile of the piston from a group a plurality of motion profiles consisting of an acceleration profile, a deceleration profile, a velocity profile, a timing profile, a force profile, a repetition profile, and any combination thereof.

33. (New) The system of claim 19 further comprising:

the control program having variables to define a motion profile of the piston selected from a group of a plurality of motion profiles consisting of an acceleration profile, a deceleration profile, a velocity profile, a timing profile, a force profile, a repetition profile, and any combination thereof.

34. (New) The system of claim 23 further comprising:

the control program having variables to define a motion profile of the piston selected from a group of a plurality of motion profiles consisting of an acceleration profile, a deceleration profile, a velocity profile, a timing profile, a force profile, a repetition profile, and any combination thereof.